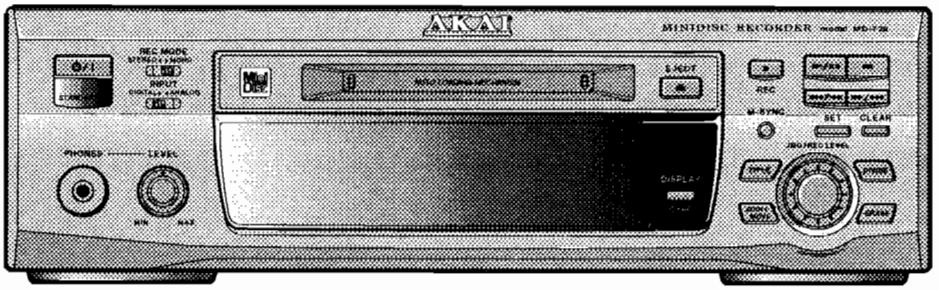
MD-720

V21528

AKAI SERVICE MANUAL



MINI DISC RECORDER

MODEL MD-720

SPECIFICATIONS

System	Mini disc digital audio system
Pickup	Semi-conductor laser pickup (λ=780 nm)
Error correction	ACIRC
Sampling frequency	44.1 kHz
Coding	ATRAC
Modulation system	EFM
Number of channels	2 channels
Frequency response	5 - 20,000 Hz (±0.5 dB, EIAJ)
S/N ratio	96 dB
Wow & flutter	Less than measurable limits (EIAJ)
Input terminal	
Analog	RCA pin jack, 500 mV/22 k ohms
Digital	Optical, 660 nm
Output terminal	
Analog	RCA pin jack, 2 V/1 k ohm Phones, 20 mW/32 ohms
Digital	Optical, −18 dBm/660 nm

Power requirement	
E1/E2/E3/B1/S1 version	220 - 230 V, 50 Hz
U5/Y6/Y7 version	110/127/220 - 230/240 V, 50/60 Hz
Power consumption	13 W
Dimensions	270 (W) x 82 (H) x 301 (D) mm
Weight	2.6 kg

Standard accessories

Remote control unit	1
Batteries	2
RCA pin cord	1
AC plug adapter	1 (U5/Y7 version only)

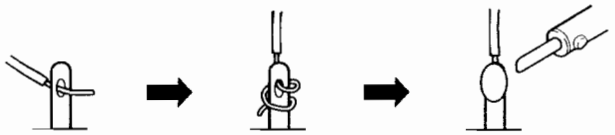
※ For improvement purposes, specifications and design are subject to change without notice.

※ US AND FOREIGN PATENTS LICENSED FROM DOLBY LABORATORIES LICENSING CORPORATION.

★ SAFETY INSTRUCTIONS

PRECAUTIONS DURING SERVICING

1. Parts identified by the ⚠ symbol are critical for safety. Replace them only with the parts number specified.
2. In addition to safety, other parts and assemblies are specified for conformance with such regulations as those applying to spurious radiation.
   These must also be replaced only with the specified replacements.
   Examples : RF converters, tuner units, antenna selector switches, RF cables, noise blocking capacitors, noise blocking filters, etc.
3. Use specified internal wiring. Note especially :
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads
4. Use specified insulating materials for hazardous live parts. Note especially :
   1) Insulation Tape
   2) PVC tubing
   3) Spacers (insulating barriers)
   4) Insulation sheets for transistors
   5) Plastic screws for fixing micro switches
5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.), wrap the ends of the wires securely around the terminals before soldering.



6. Make sure that wires do not contact heat producing parts (heat sinks, oxide metal film resistors, fusible resistors, etc.).
7. Check that replaced wires do not contact sharp edged or pointed parts.
8. Also check areas surrounding repaired locations.
9. Make sure that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

SAFETY CHECK AFTER SERVICING

After servicing, make measurements of leakage-current or resistance in order to determine that exposed parts are acceptably insulated from the supply circuit. The leakage-current measurement should be done between accessible metal parts (such as chassis, ground terminal, microphone jacks, signal input/output connectors, etc.) and the earth ground through a resistor of 1500 ohms paralleled with a 0.15 μF capacitor, under the unit's normal working conditions. The leakage-current should be less than 0.5 mA rms AC. The resistance measurement should be done between accessible exposed metal parts and power cord plug prongs with the power switch (if included) "ON". The resistance should be more than 2.2 M ohms.

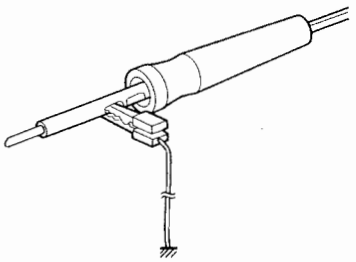
MAKE YOUR CONTRIBUTION TO PROTECT THE ENVIRONMENT

Used batteries with the ISO symbol for recycling as well as small accumulators (rechargeable batteries), mini-batteries (cells) and starter batteries should not be thrown into the garbage can.
Please leave them at an appropriate depot.

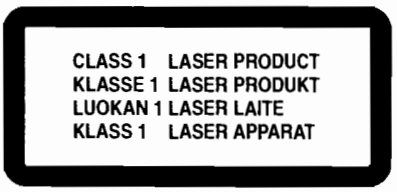
PRECAUTIONS IN REPAIRING

When repairing or adjusing the unit, please note the following points.

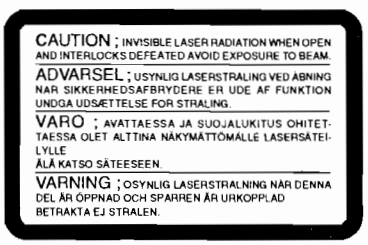
1. Do not put excessive pressure on the mechanical part (operation part), including the pick-up block, as extremely high mechanical precision is required in these parts.
2. When the base is removed for repair or adjustment, make sure that there are no metal obiects in the narrow gap between the P.C. board or the mecha parts and the base.
3. The Micro-Computer and the CD signal processing ICs can be damaged by static electricity or leakage from a soldering iron during repairing. While soldering, please take the precautions against leakage as in the illustration.



4. Do not loosen any screws in the pick-up block.
   When handling the pick-up block, please refer to the points to NOTE when replacing the pick up block.
5. To avoid hazardous invisible Laser Radiation, DO NOT look at the Laser Beam (Objective lens) directly.
6. On models for some countries, laser warning labels are affixed on the unit and inside of the unit, as shown below. For your safety, read these labels carefully when repairing or adjusting the unit.



Label affixed on the rear panel of the unit.


CAUTION ; INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED AVOID EXPOSURE TO BEAM.
ADVARSEL ; USYNLIG LASERSTRALING VED ABNING NAR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGA UDSÆTTELSE FOR STRALING.
VARO ; AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE
ÄLÄ KATSO SÄTEESEEN.
VARNING ; OSYNLIG LASERSTRALNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPARREN ÄR URKOPPLAD BETRAKTA EJ STRALEN.

Label affixed on the left side of the MD mechanism block.

★ INFORMATION

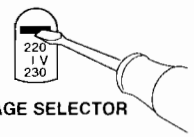
SYMBOLS FOR PRIMARY DESTINATION

Unit destinations are indicated with letters as shown below.

Symbols	Principal Destinations
[A]	U.S.A
[B]	U.K.
[C]	Canada
[E]	Europe (except U.K.)
[J]	Japan
[S]	Australia
[V]	Germany
[U]	UniversalArea
[Y*]	Custom version

VOLTAGE CONVERSION ([U] Version only)

Before connecting the power cord, make sure that the voltage selector on the rear panel is set to the correct voltage for your area. If not, please set it correctly.

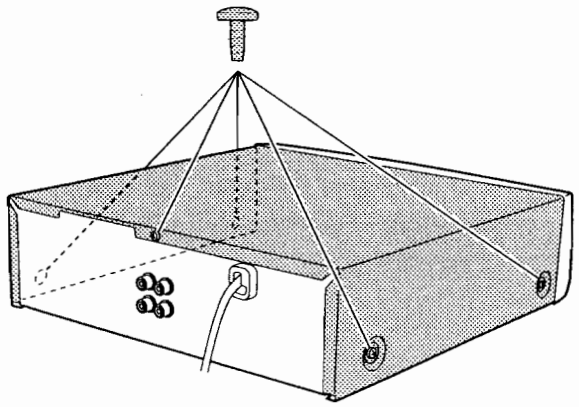


VOLTAGE SELECTOR

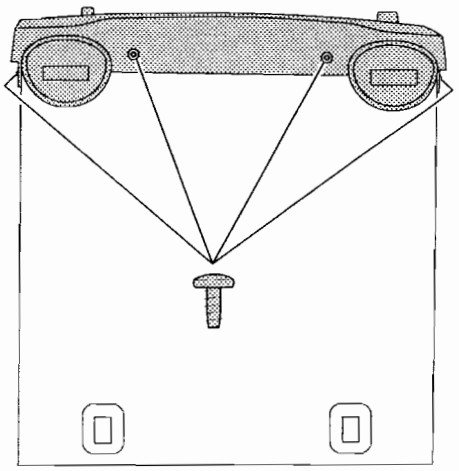
I. DISASSEMBLY

In case of trouble etc., necessitating dismantling, please dismantle in the order shown in the illustrations.
Reassemble in the reverse order.

1. Removal of the UPPER COVER.



2. Removal of the FRONT PANEL.



II. PRINCIPAL PARTS LOCATION

NOTE

Replacement of any of the parts in the MD mechanism block is not possible. if replacement of any of the parts is necessary, replace the entire MD mechanism block only.

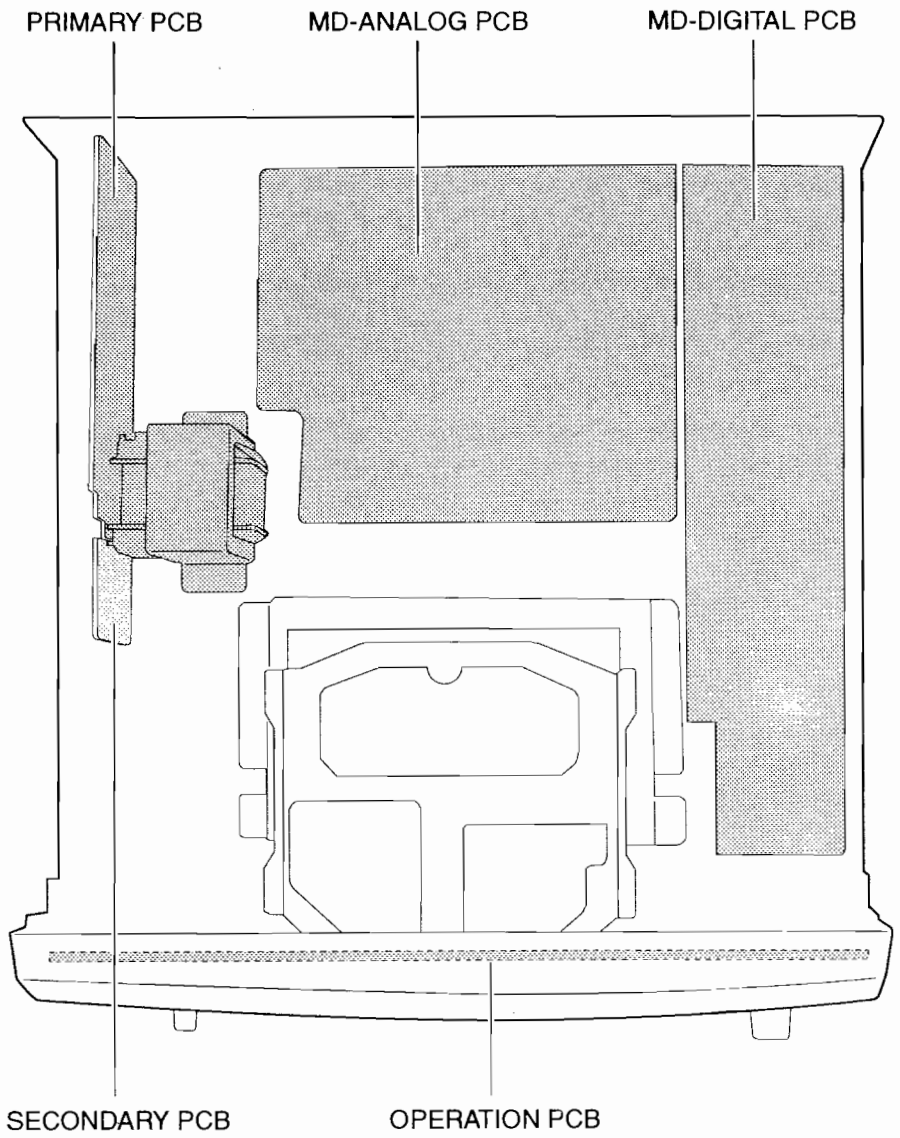


Fig. 2-1 Top view

III. PARTS LIST

ATTENTION

1. When placing an order for parts, be sure to list the Part No., Model No. and the description of each part. Otherwise, the non-delivery of the part or the delivery of a wrong part may result.
2. Please make sure that Part No. is correct when ordering. If not, a part different from the one you ordered may be delivered.
3. Since the parts shown in Parts List or Preliminary Service Manual may have been the subject of changes, please use this Parts List for all future reference.

HOW TO USE THIS PARTS LIST

1. This Parts List lists those parts which are considered necessary for repairs. Other common parts, such as resistors and capacitors, are listed in the "Common List for Service Parts" from which these parts should be selected and stocked.
2. The Recommended Spare Parts List shows those parts in the Parts List which are considered particularly important for service.
3. Parts not shown in the Parts List and "Common List for Service Parts" will not in principle be supplied.
4. How to read the Parts List.

a) Mechanism Block

2. HEAD BASE BLOCK

Ref. No.	Part. No.	Description
1	BH-T2023A320A	HEAD BASE BLOCK
2	HP-H2206A010A	HEAD R/P PR4-8FU C
3	ZS-477876	PAN20↔03STL CMT
4	ZS-536488	BID20↔08STL CMT
5	ZG-402895	SP CS ANGLE ADJUST

SP (Service Parts) Classification

This number corresponds with the individual parts index number in the figure.

b) PC Board

2. MAIN PC BOARD

Ref. No.	Part. No.	Description
IC1	EI-324536	IC HD14049BP
IC2	EI-336801	IC MB8841-564M
C1A	EC-338399	C MMY V 223M 250AC [U,E,B,S]
C1B	EC-350949	C MMY V 223M 250DC [J]
C1C	EC-338397	C MMY V 223M 125AC [C,A]
X1	EI-318384	OSC X'TAL NC-18C

Symbols for primary destination
[A] : AAL (U.S.A) [S] : SAA (Australia)
[B] : BEAB (England) [U] : U/T (Universal Area)
[C] : CSA (Canada)
[E] : CEE (Europe) [V] : VDE (Germany)
[J] : JPN (Japan) [Y] : Custom

SP (Service Parts) Classification

These reference symbols correspond with component symbols in the Schematic Diagrams.

The available PC Board Blocks are listed separately.

5. When Part No. is known, Parts Index at end of Parts List can be used to locate where that part is shown in Parts List by its Reference No. listed at right of Part No.

WARNING

⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

AVERTISSEMENT

⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉDE L'APPAREIL, NE REMPLACER QUE DES PIÉCES RECOMMANDEES PAR LÉ FABRICANT.

1. P.C. BOARD BLOCK

Ref. No.	Parts No.	Description
1	AK-P3001C510A	PC(#)MD BLK MD-720-S(E1) [E1,E2,E3,B1,S1]
2	AK-P3001C510F	PC(#)MD BLK MD-720-S(U5) [U5,Y6,Y7]
3	AK-P3001C520A	PC(#)OPE BLK MD-720-S(E1)

2. MD-ANALOG P.C. BOARD

Ref. No.	Parts No.	Description
D1001	030-320131-01H	D SILICON H 1SS131T T52
D1002	030-320131-01H	D SILICON H 1SS131T T52
D1003	030-320131-01H	D SILICON H 1SS131T T52
D1004	030-320131-01H	D SILICON H 1SS131T T52
D1005	030-320131-01H	D SILICON H 1SS131T T52
D1006	030-320131-01H	D SILICON H 1SS131T T52
D1008	130-410062-10H	D ZENER MTZJ6.2B T52
D1010	030-320131-01H	D SILICON H 1SS131T T52
D1011	030-320131-01H	D SILICON H 1SS131T T52
D1012	130-410075-13H	D ZENER MTZJ7.5A T52
D1013	130-410075-13H	D ZENER MTZJ7.5A T52
D1203	030-320131-01H	D SILICON H 1SS131T T52
D1204	030-320131-01H	D SILICON H 1SS131T T52
D1205	030-320131-01H	D SILICON H 1SS131T T52
IC1000	⚠033-500313-17	IC PQ3RD13
IC1001	⚠033-500511-17	IC PQ05RD11
IC1002	⚠033-500511-17	IC PQ05RD11
IC1050	033-J09413-14A	IC TC9413AP
IC1051	033-904558-30A	IC NJM4558L
IC1053	033-904558-30A	IC NJM4558L
IC1200	034-878053-13A	IC UPD78053GC-222-3B9 MICRO-M2
IC1201	034-304050-14	IC TC74HC4050AF
J1050	061-472449-00	PIN J HSP-244V9-01 4P
J1202	060-614126-07	SOCKET 14FE-BT-VK-N 14P
J1203	060-608126-07	SOCKET 08FE-BT-VK-N 8P
P1000	060-407205-0B	PLUG B7B-PH-K WHT 7P
TR1000	031-232458-25V	TR 2SC2458 Y,GR T05
TR1001	031-211048-57V	TR 2SA1048 Y,GR T05
TR1002	031-430114-05V	DTR DTA114ES(10-10) T05
TR1003	031-440114-60V	DTR DTC114TS(10) T05
TR1004	031-440114-05V	DTR DTC114ES(10-10) T05
TR1005	031-440114-60V	DTR DTC114TS(10) T05
TR1006	031-430114-05V	DTR DTA114ES(10-10) T05
TR1007	031-440114-60V	DTR DTC114TS(10) T05
TR1008	⚠031-221443-00V	TR 2SB1443 TV2
TR1009	031-440144-05V	DTR DTC144ES(47-47) T05
TR1010	031-440114-60V	DTR DTC114TS(10) T05
TR1050	031-232458-25V	TR 2SC2458 Y,GR T05
TR1051	031-232458-25V	TR 2SC2458 Y,GR T05
TR1202	031-430114-05V	DTR DTA114ES(10-10) T05
TR1203	031-233576-00V	TR 2SC3576 T05
TR1204	031-233576-00V	TR 2SC3576 T05
TR1205	031-211048-57V	TR 2SA1048 Y,GR T05
TR1206	031-440114-60V	DTR DTC114TS(10) T05
X1200	007-205000-06	OSC CE CST5.00MGW 5.000MHZ

3. MD-DIGITAL P.C. BOARD

Ref. No.	Parts No.	Description
C1017	126-016010-01	C DBL LAYER EECS5R5V 105 5.5DC
D1051	130-410062-10H	D ZENER MTZJ6.2B T52
IC1052	034-004520-00A	IC AK4520A-VF
IC1100	034-800003-64	IC MB-M3 RU8X11AMF-****
IC1101	034-307404-14	IC TC74HCU04AF
IC1102	034-307474-14	IC TC74HC74AF
IC1104	033-201641-16	IC LB1641
J1100	036-600038-01	SOCKET OPTICAL GP1F38T
J1101	036-600038-00	SOCKET OPTICAL GP1F38R
J1102	060-629106-07	SOCKET 29FMN-BTRK 29P
J1103	060-619106-07	SOCKET 19FMN-BTRK 19P
L1100	105-100106-24H	COIL FIX 1 LAP02TA T26 100J
TR1100	031-211048-57V	TR 2SA1048 Y,GR T05
TR1101	031-440114-05V	DTR DTC114ES(10-10) T05
X1100	007-212000-16	OSC CE CST12.0MTW 12.000MHZ
X1101	037-032768-10J	OSC X'TAL DT38 32.768KHZ
X1102	037-225792-30J	OSC X'TAL HC-49U 22.57920MHZ

4. PRIMARY P.C. BOARD

Ref. No.	Parts No.	Description
C1400	⚠123-102169-42	C CE V DE0807 E102M-KH 250VAC
C1401	⚠123-102169-42	C CE V DE0807 E102M-KH 250VAC
F1	⚠082-220160-06	FUSE TIME 218 250V 160MA [U5,Y6,Y7]
L1400	⚠001-213859-95	COIL LF LF-4Z-102
P1400	⚠060-402395-00	PLUG B2P-3-VH P7.92 2P
SW1400	⚠040-014910-00	SW SELECT HXW0244-01-420 [U5,Y6,Y7]

5. OPERATION P.C. BOARD

Ref. No.	Parts No.	Description
D1500	030-510031-00	D LED MSB31TA RED
IC1500	033-905218-12A	IC M5218AL
IC1501	034-009202-39	IC MSM9202-01GS-K
IN1500	035-131403-00	IND FL SVA-14MM03
J1500	061-123509-10	PHONE J HTJ-035-17DB 3.5
J1501	060-614126-07	SOCKET 14FE-BT-VK-N 14P
J1502	060-608126-07	SOCKET 08FE-BT-VK-N 8P
PH1500	036-600440-00	DETECTOR SPS-440-1
SW1500	041-012410-04	SW SLIDE SSSS912N-4C2-0
SW1501	041-012410-04	SW SLIDE SSSS912N-4C2-0
SW1503	040-012410-20	SW ROTARY EC16B24204
TR1500	031-232458-25V	TR 2SC2458 Y,GR T05
TS1500	046-110201-00	SW TACT 1.T-1102A 160GM
TS1501	046-110201-00	SW TACT 1.T-1102A 160GM
TS1502	046-110201-00	SW TACT 1.T-1102A 160GM
TS1503	046-110201-00	SW TACT 1.T-1102A 160GM
TS1504	046-110201-00	SW TACT 1.T-1102A 160GM
TS1505	046-110201-00	SW TACT 1.T-1102A 160GM
TS1506	046-110201-00	SW TACT 1.T-1102A 160GM
TS1507	046-110201-00	SW TACT 1.T-1102A 160GM
TS1508	046-110201-00	SW TACT 1.T-1102A 160GM
TS1509	046-110201-00	SW TACT 1.T-1102A 160GM
TS1510	046-110201-00	SW TACT 1.T-1102A 160GM
TS1511	046-110201-00	SW TACT 1.T-1102A 160GM
TS1512	046-110201-00	SW TACT 1.T-1102A 160GM
TS1513	046-110201-00	SW TACT 1.T-1102A 160GM
TS1514	046-110201-00	SW TACT 1.T-1102A 160GM
VR1500	011-203198-20	VR ROTARY RK14K12C L20.0 A203

6. SECONDARY P.C. BOARD

Ref. No.	Parts No.	Description
D1450	⚠130-314002-04V	D SILICON 1N4002NO2 T05 100/1A
D1451	⚠130-314002-04V	D SILICON 1N4002NO2 T05 100/1A
D1452	⚠130-314002-04V	D SILICON 1N4002NO2 T05 100/1A
D1453	⚠130-314002-04V	D SILICON 1N4002NO2 T05 100/1A
D1454	⚠130-314002-04V	D SILICON 1N4002NO2 T05 100/1A
D1455	⚠130-314002-04V	D SILICON 1N4002NO2 T05 100/1A
D1456	130-410056-30H	D ZENER MTZJ5.6C T52
D1457	⚠130-314002-04V	D SILICON 1N4002NO2 T05 100/1A
D1458	130-410360-10H	D ZENER MTZJ36B T52
TR1450	⚠031-232458-25V	TR 2SC2458 Y,GR T05
TR1451	031-211048-57V	TR 2SA1048 Y,GR T05
TR1452	⚠031-221375-00	TR 2SB1375

7. ACCESSARY

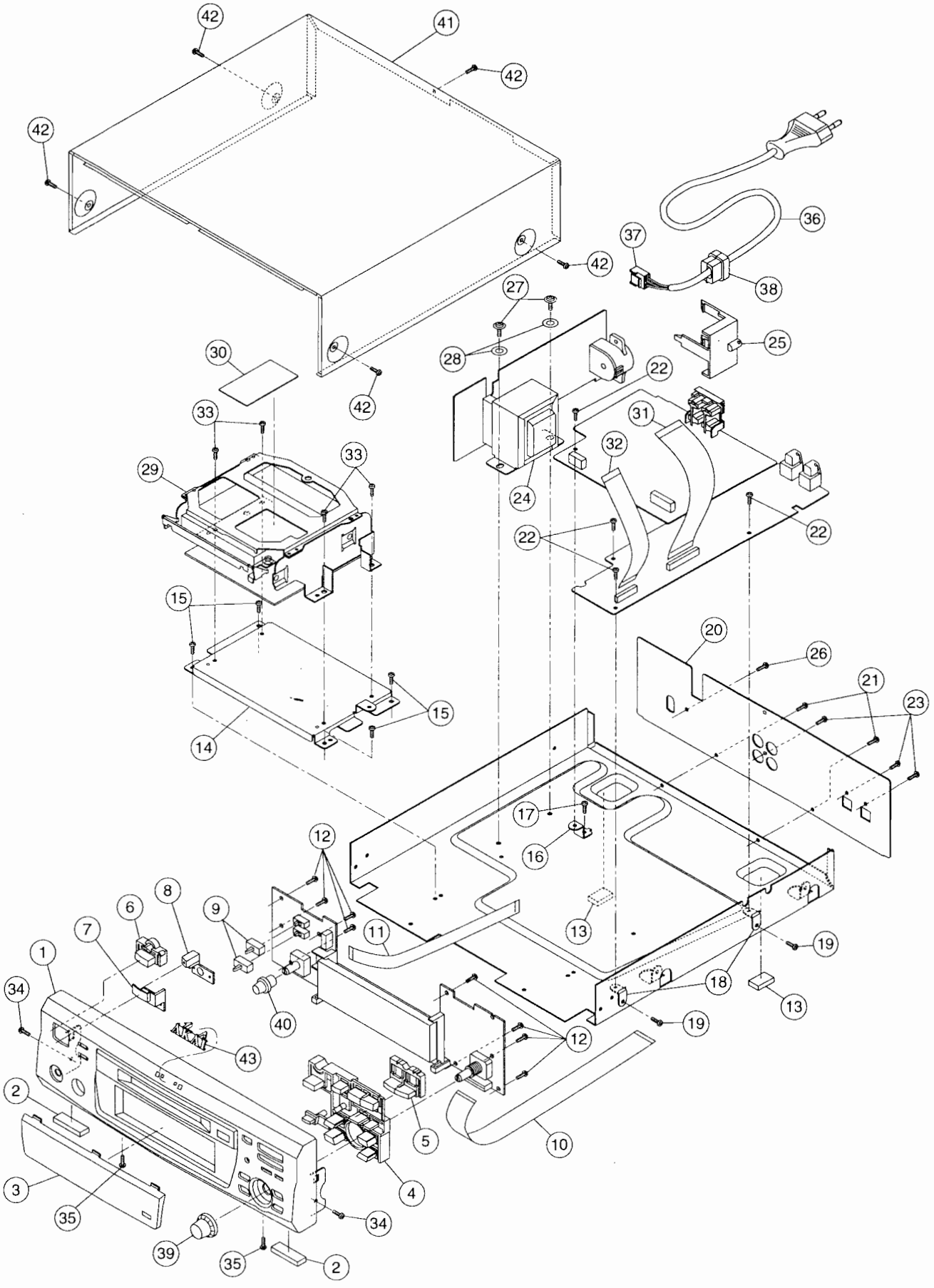
Ref. No.	Parts No.	Description
1	⚠061-840041-07	PLUG ADAPTOR DW-041 [U5,Y7]
2	790-010301-04	REMOCON RC-MD720
3	061-440003-00	CORD PIN-PIN L1000 2P

8. FINAL ASSEMBLY BLOCK

Ref. No.	Parts No.	Description
1	200-AA0701-01R	PANEL FRONT MD-720
2	330-385001-01	CUSHION FOOT (CH)
3	263-AA0701-01K	WINDOW FLD
4	292-AA0701-01S	BUTTON FUNCTION
5	292-AA0702-01S	BUTTON SKIP
6	292-AA0703-01S	BUTTON POWER
7	263-AA0702-01K	WINDOW REMOCON
8	229-AA0702-01R	HOLDER LED
9	292-AA0706-01S	KNOB SLIDE
10	077-755241-14	CORD FFC BD P1.25 L230 14P [W983]
11	077-755251-08	CORD FFC BD P1.25 L240 8P [W984]
12	619-300210-00	BT BID30*10STL BZN
13	330-385002-01	CUSHION FOOT REAR (CH)
14	422-AA0701-01	HOLDER MECHA
15	619-300206-10	BT BID30*06STL NI3
16	428-AA0701-01	HOLDER PCB-A
17	619-300206-10	BT BID30*06STL NI3
18	428-AA0702-01	HOLDER PCB-B
19	619-300206-10	BT BID30*06STL NI3
20-A	495-AA0701-01	PANEL REAR MD-720 [E1,E2,E3,B1]
20-B	495-AA0701-02	PANEL REAR MD-720 [S1]
20-C	495-AA0702-01	PANEL REAR MD-720 [Y7]
20-D	495-AA0702-02	PANEL REAR MD-720 [U5,Y6]
21	606A301208-00	BT BID30 x 08STL BZN PROJ.
22	619-300206-10	BT BID30 x 06STL NI3
23	606A301208-00	BT BID30 x 08STL BZN PROJ.
24-A	⚠001-48AA07-B2A	TRANS POW P3001 E [E1,E2,E3,B1,S1]
24-B	⚠001-48AA07-02A	TRANS POW P3001 U [U5,Y6,Y7]
25	229-AA0703-01R	HOLDER SW [U5,Y6,Y7]
26	606A301208-00	BT BID30 x 08STL BZN PROJ. [U5,Y6,Y7]
27	602-407008-60A	ST PAN40 x 08STL CMT CUP
28	633-076040-10	SW40STL CMT
29	751-MBL301-01	MECHA MD MBL-3F//M
30	388-AA1101-01	COVER HEAD
31	077-755178-29	CORD FFC AD P1.00 L165 29P [W980]
32	077-755168-19	CORD FFC AD P1.00 L145 19P [W981]
33	619-300206-10	BT BID30 x 06STL NI3
34	619-300208-00	BT BID30 x 08STL BZN
35	619-300308-00	BT CTS30 x 08STL BZN
36-A	⚠071-669078-00A	AC CORD E [E1,E2,E3,U5,Y7]
36-B	⚠071-449078-20	AC CORD B [B1,Y6]
36-C	⚠071-559078-10	AC CORD S [S1]
37	060-103402-20	SOCKET HOUSING P2438-3 3P
38	650-381301-01	CORD BUSH 5RF-5
39	292-AA0704-01S	KNOB JOG
40	292-AA0705-01S	KNOB PHONE
41	491-AA0702-01	COVER UPPER
42	606A301208-00	BT BID30 x 08STL BZN PROJ.
43	286-385001-02S	NAME PLATE AKAI(S) (CH)

NOTE :
Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.

FINAL ASSEMBLY BLOCK



INDEX

Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.
001-213859-95	4-L1400	046-110201-00	5-TS1503	495-AA0701-02	8-20-B		
001-48AA07-02A	8-24-B	046-110201-00	5-TS1504	495-AA0702-01	8-20-C		
001-48AA07-B2A	8-24-A	046-110201-00	5-TS1505	495-AA0702-02	8-20-D		
007-205000-06	2-X1200	046-110201-00	5-TS1506	602-407008-60A	8-27		
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011-203198-20	5-VR1500	046-110201-00	5-TS1508	606A301208-00	8-23		
030-320131-01H	2-D1001	046-110201-00	5-TS1509	606A301208-00	8-26		
030-320131-01H	2-D1002	046-110201-00	5-TS1510	606A301208-00	8-42		
030-320131-01H	2-D1003	046-110201-00	5-TS1511	619-300206-10	8-15		
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030-320131-01H	2-D1010	060-103402-20	8-37	619-300206-10	8-33		
030-320131-01H	2-D1011	060-402395-00	4-P1400	619-300208-00	8-34		
030-320131-01H	2-D1203	060-407205-0B	2-P1000	619-300210-00	8-12		
030-320131-01H	2-D1204	060-608126-07	2-J1203	619-300308-00	8-35		
030-320131-01H	2-D1205	060-608126-07	5-J1502	633-076040-10	8-28		
030-510031-00	5-D1500	060-614126-07	2-J1202	650-381301-01	8-38		
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031-211048-57V	6-TR1451	061-123509-10	5-J1500	AK-P3001C510F	1-2		
031-221375-00	6-TR1452	061-440003-00	7-3	AK-P3001C520A	1-3		
031-221443-00V	2-TR1008	061-472449-00	2-J1050				
031-232458-25V	2-TR1000	061-840041-07	7-1				
031-232458-25V	2-TR1050	071-449078-20	8-36-B				
031-232458-25V	2-TR1051	071-559078-10	8-36-C				
031-232458-25V	5-TR1500	071-669078-00A	8-36-A				
031-232458-25V	6-TR1450	077-755168-19	8-32				
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031-233576-00V	2-TR1204	077-755241-14	8-10				
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031-430114-05V	2-TR1202	105-100106-24H	3-L1100				
031-440114-05V	2-TR1004	123-102169-42	4-C1400				
031-440114-05V	3-TR1101	123-102169-42	4-C1401				
031-440114-60V	2-TR1003	126-016010-01	3-C1017				
031-440114-60V	2-TR1005	130-314002-04V	6-D1450				
031-440114-60V	2-TR1007	130-314002-04V	6-D1451				
031-440114-60V	2-TR1010	130-314002-04V	6-D1452				
031-440114-60V	2-TR1206	130-314002-04V	6-D1453				
031-440144-05V	2-TR1009	130-314002-04V	6-D1454				
033-201641-16	3-IC1104	130-314002-04V	6-D1455				
033-500313-17	2-IC1000	130-314002-04V	6-D1457				
033-500511-17	2-IC1001	130-410056-30H	6-D1456				
033-500511-17	2-IC1002	130-410062-10H	2-D1008				
033-904558-30A	2-IC1051	130-410062-10H	3-D1051				
033-904558-30A	2-IC1053	130-410075-13H	2-D1012				
033-905218-12A	5-IC1500	130-410075-13H	2-D1013				
033-J09413-14A	2-IC1050	130-410360-10H	6-D1458				
034-004520-00A	3-IC1052	200-AA0701-01R	8-1				
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040-014910-00	4-SW1400	388-AA1101-01	8-30				
041-012410-04	5-SW1500	422-AA0701-01	8-14				
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046-110201-00	5-TS1500	428-AA0702-01	8-18				
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AKAI

MODEL MD-720

SCHEMATIC DIAGRAMS AND PC BOARDS

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II. SCHEMATIC DIAGRAM AND PC BOARDS 14

III. INFOMATION OF ICs 17

Use these schematic diagrams and PC boards together with the provided service manual.

A | B | C | D | E | F

SECONDRY PC

TR1450
+5V REG

PHONE LEVEL
HP AMP
IC1500 M5218AL
HP AMP
VR1500
J1500
PHONES
STANDBY/ON
+3.3V
TR1500
H:ON

PH1500
(REMOCON SIGNAL DETECT)

IC1201 TC74HC4050AF
IN4 (9) (10) OUT4

IN1500
FLD
G1~G14
S1~S36
VF2
VF1
TR1203, 1204
H:ON
TR1202

IC1501 MSM9202
(FLD DRIVER)
-VP (56) -VP
DATA (53) FLDATA
CP (62) FLCP
CS (61) FLCS
RESET (60) FLRST

JOG/REC LEVEL
SW1503
(ROTARY ENCODER)
(80) ENC-1
(79) ENC-2

BS/FB STOP FS/FF CLEAR DIVIDE ERASE
(1) KEY2
ANALOG
DIGITAL
M-SYNC REC PAUSE PLAY/PAUSE SET
(2) KEY2
MONO
STEREO
POWER EJECT DISPLAY JOIN/MOVE TITLE
(3) KEY3
+3.3V

IC1200
μPD78053GC
(SYSTEM CONTROL MI-COM)

FROM IC1001 (+5V)
7.5V
TR1010 OVER VOLTAGE DETECT
TR1009
7.5V
IC1000 3.9V REG
+3.3V
+3.3V
10.6V
TR1008
-VP
TO PH1500
+5VIN

+3.3V
+3.3V
TR1206
TR1205
+5VIN
H:ON
+3.3V
TR1003
H:ON
TR1007
H:ON

REMOCON (57) P.LED (55) BUS-D-I (16) BUS-CLK-IN (18) RST (20)
(51) VF-ON/OFF
J-VERSION (59)

VCK (37)
VSTB (38)
VDATA (39)
S-AMUTE (50)
PAC-OUT (41)

X2 (69) X1 (70) STB (52) MRXD (9) MTXD (8) MRST (6) MCST (5) SCHACK-IN (15) CHACK-IN (10)
X1200 5.00MHz
+5V
OVER VOLTAGE DETECT
FROM
5V REG

X1101 32.768KHz
(24) (25) (36) (57) (58) (59) (60) (6) (23) (13) (20)
XOUT-T XIN-T STB MRXD MTXD MRST MCST SCHACK-IN BACK-UP POWER DOWN RESET
+5V-D
TO MECH

IC1104 LB1641
(BI-DIRECTIONAL MOTOR DRIVER)
+11V
VCC1 (7) (8) VCC2
OUT2 (10) IN2 (6) LD OUT (94)
OUT1 (2) IN1 (5) LD IN (95)
VZ (4)
+11V
SPEED CONTROL
TR1100, 1101
6.2V
LD-LOW (39)
X1100 12MHz
X OUT (27)
X IN (28)

M-AMUTE (93)
DARST (83)
EMPO (70)
IC1101 6/6
D/A RE

IC1100 MB-M3
(MECHANISM CONTROL MI-COM)

SENS (32) SHOCK (33) DQSY (16) DIG-RST (81) SQ SYNC (15) SCL (53) XINT (12) MNT2 (41) LDON (75) MOD (86) REC-POSITION (57) REFLECT (98) PB-POSITION (58) PROTECT (97) LIMIT-IN (96)
SCLK (67) SRDT (69) XLATCH (90) WRPWR (80) SWDT (68) MNT3 (42) FOK (77) SDA (52) SCTX (89) PAC-OUT (8)
CHACK-IN
IC1102 TC74HC04
LRCK
BCK
512fs

OPERATION PCB

MAGNETIC HEAD
DISC MECHANISM
OPTICAL PICKUP
PRE AMP
SERVO
EFM ACIRC
ADIP DECODER
SHOCK RES MEMORY CONTROLLER
2MB DRAM
ATRA ENCOD DECOD
SAMPL RAT CONVER
LOADING MOTOR

PB SIGNAL LINE
REC SIGNAL LINE
DIGITAL SIGNAL LINE

MECHANISM BLOCK

A | B | C | D | E | F

F
G
H
I
J
1
2
3
4
5
6
7
8
TR1451, 1452
-35V REG
TR1450
+5V REG
CONDRY PCB
TR1009
L:ON
TR1008
10.6V
+AC (+10.7V)
-AC (-12V)
VF1
VF2
ANALOG IN/OUT
L.IN
R.IN
L.OUT
R.OUT
+3.3V
+5V IN
TR1002
L:ON
H:ON
TR1004
TR1005
H:ON
H:ON
IC1050
TC9413AP
(EVR)
VCK
VSTB
VDATA
+3.3V
TR1006
L:ON
TR1051
H:ON
M-AMUTE
S-AMUTE
-12V
TR1050
H:ON
FROM POWER SUPPLY
(10.6V)
OVER VOLTAGE DETECT
IC1001
PQ05RD11
5V REG
5V REG
STB
IC1002
PQ05RD11
IC1051
NJM4558L
IC1053
NJM4558L
MD-ANALOG PCB
+5V-D
+5V-D (M)
TO MECHA.BLK
+5V-A
D/A RESET
DARST
DARST
IC1101
EMP02
LRCK
BCK
MCLK
AINL+
AINL-
AINR-
AINR+
AOUTL
AOUTR
IC1052
AK4520A-VF
(20BIT, 2-CH ΔΣ ADC & DAC)
A/D
D/A
ADDT
DADT
IC1102
TC74HC04
1/2 COUNTER
IC1101
TC74HC74
CHACK-IN
LRCK
BCK
512fs
X1102
22.58MHz
IC1101
TC74HC74
J1101
DIGITAL IN
ATRAC ENCODER+ DECODER
SAMPLING RATE CONVERTER
J1100
DIGITAL OUT
MD-DIGITAL PCB
MD-720
BLOCK DIAGRAM
No. P300151M
A1

A
B
C
D
E
F
1
2
3
4
5
6
7
8
14
PHONES LEVEL
(IC1500 (1/2) MS218AL
(IC1500 (2/2) MS218AL
RK14K12C L20.0 A203
VR1500
PHONES
SPS-440-1
PH1500
W1500
ERATH-LUG-L100
STANDBY/ON
MS831TA
D1500
TR1500 2SC2458
SW1500 SSSS912N-4C2-0
POWER
EJECT
DISPLAY
JOIN/MOVE
TITLE
SW1501 SSSS912N-4C2-0
M-SYNC
REC PAUSE
PLAY/PAUSE
SET
BS/FB
STOP
FS/FF
CLEAR
DIVIDE
ERASE
TS1500-1514 : 1.T-1102A 160GM
JOG/REC LEVEL
SW1503 EC16824204
DIGITAL-AN/LOG
STEREO-ADJ
J1500
J1501
J1202
J1203
J1502
J1015
J1103
J1102
IC1200
UPD78053GC-222-3B9 MICRO-M2
(UPD78053GC-204-3B9 MICRO-M1)
IC1201 TC74HC4050AF
IC1104 LB1641
IC1501 MSM9202-01 GS-K
IC1100
MB-M3 RUBX11AMF-****
X1200 CSTS 0.0MGW 5.000MHZ
X1100 12.000MHZ
X1101 DT-38 32.768KHZ
TR1202 DTA114ES
TR1205 2SA1048
TR1206 DTC114TS
TR1101 DTC114ES
TR1100 2SA1048
TR1005 DTC114TS
TR1004 DTC114ES
D1205 1SS131
S-AMUTE 1SS131
IN1500 SVA-14AA03
OPERATION PCB
P3001A502A
MD MECHA BLK MB-M3F//M
(SONY)

	T900
MD-720 (E)	P3001E
MD-720 (U)	P3001U

MD-ANALOG PCB
P3002A501A

P3001A502B SECONDARY PCB

PRIMARY PCB
P3002A501D

PRIMARY PCB
P3002A501D

MD-DIGITAL PCB
P3002A501B

DIGITAL OUT

DIGITAL IN

Lch OUT

Rch

Lch IN ANALOG

Rch

J1102
29PMN-STRK 29P

B (POWER SUPPLY) LINE
DIGITAL OUT SIGNAL LINE
DIGITAL IN SIGNAL LINE
L-CH ANALOG PB SIGNAL LINE
L-CH ANALOG REC SIGNAL LINE

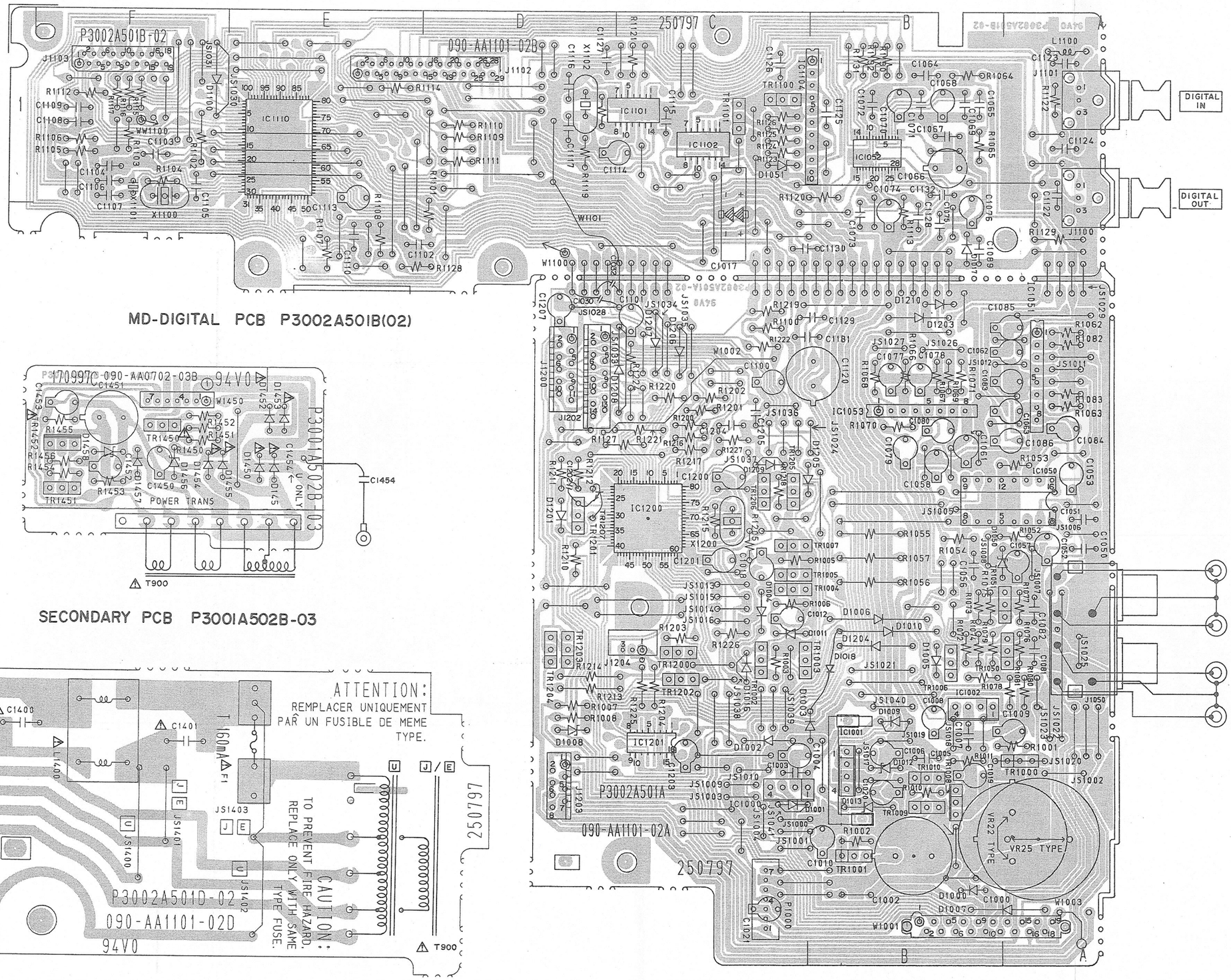
INDICATED VOLTAGES WERE MEASURED DURING PLAY MODE.

WARNING: ⚠ AND ▨ INDICATE SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY. REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSMENT: ⚠ ET ▨, ILS INDIQUENT LES COMPOSTANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT

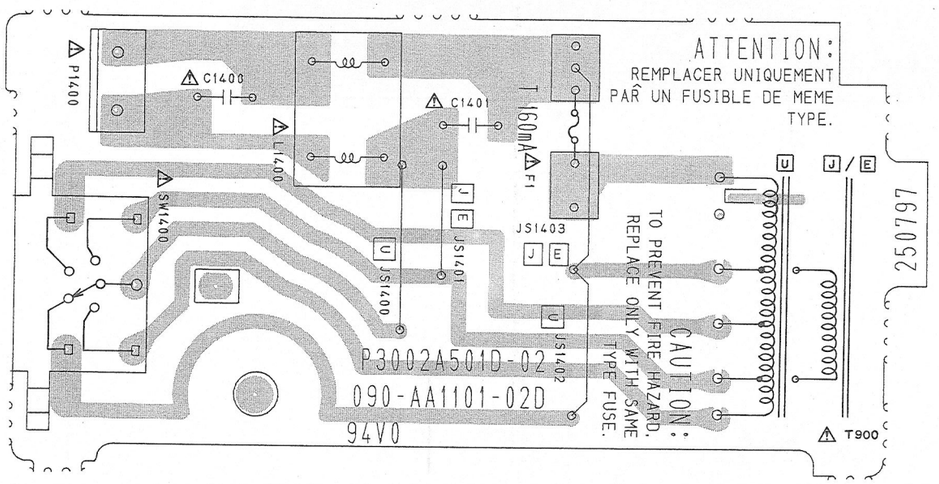
NOTE:
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS
ALL CAPACITORS IN μF (P=PF)
ALL ELECTROLYTIC CAPACITORS IN μF/WV

MD-720
SCHEMATIC DIAGRAM
No. P300101M
A1



MD-DIGITAL PCB P3002A501B(02)

SECONDARY PCB P3001A502B-03



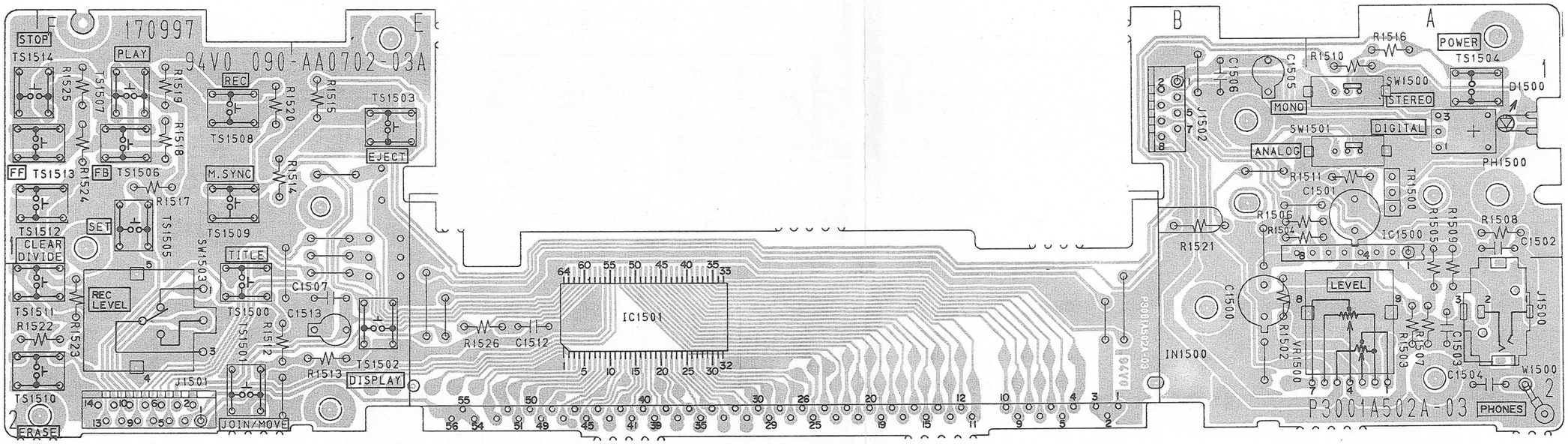
PRIMARY PCB P3002A501D-02

MD-ANALOG PCB P3002A501A(02)

NOTE:
PARTS DIFFER DEPENDING ON MODEL NUMBER. REFER TO SCHEMATIC DIAGRAMS FOR PERTINENT PARTS INFORMATION.

WARNING: ⚠ INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

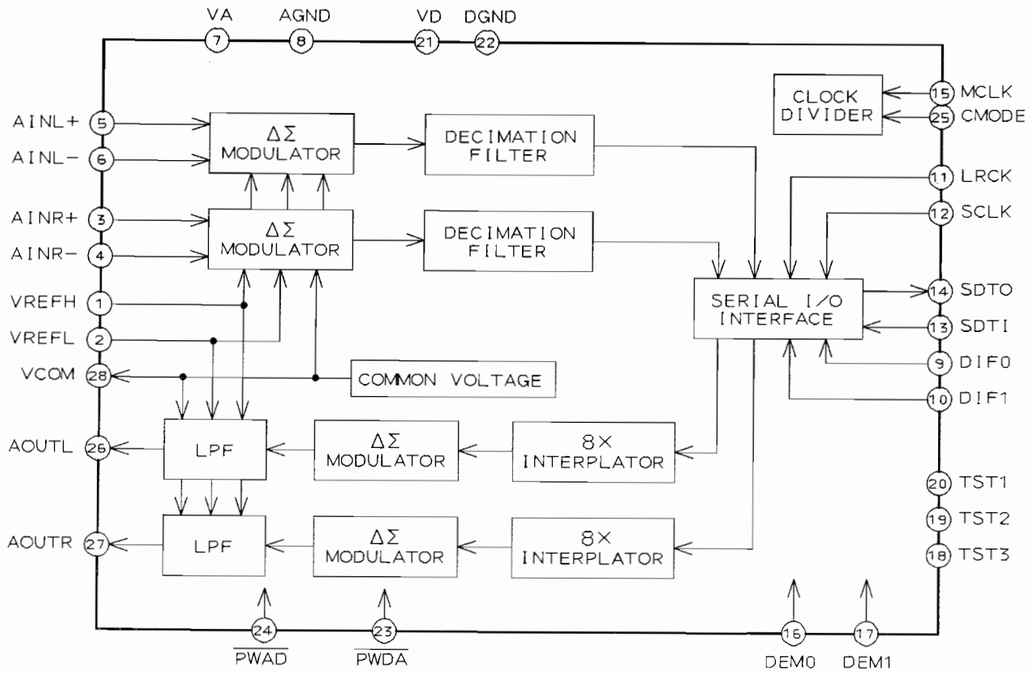
AVERTISSEMENT: ⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LE FABRICANT



OPERATION PCB P3001A502A-03

INFORMATION OF ICs

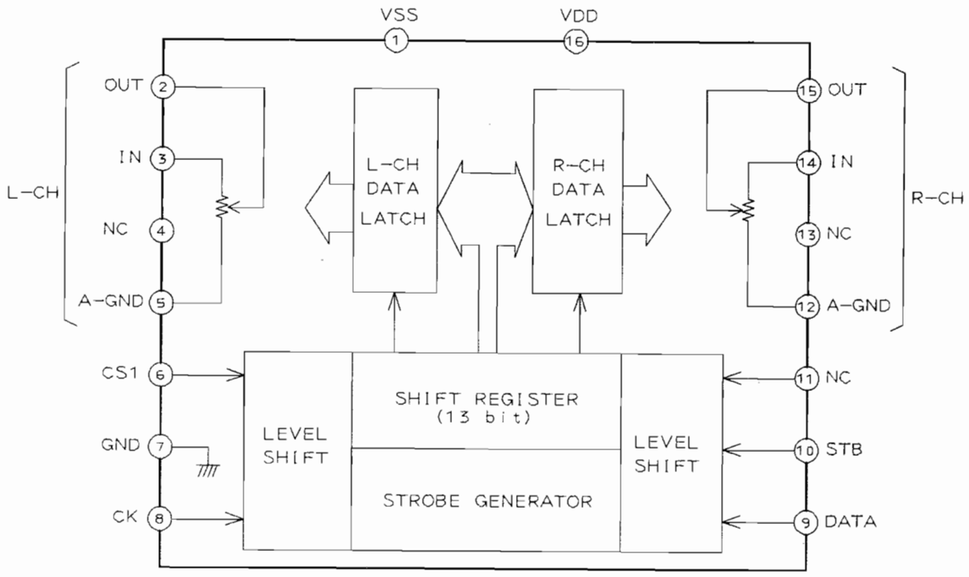
AK4520A (20 bit 2 channel Δ∑ADC & DAC)



MB-M3 (MD mechanism control MI-COM)

PIN No.	PORT NAME	I/O	FUNCTION
1,2,30,40,46, 71-73,76,78,79, 82,84,85,87,88, 91,92	NC	–	Not used (open).
3-5,7,74	–	I	These pins are connected to the power supply (+3.3 V).
6	SCHACK-IN	I	Detection input from the chacking in switch. (CHACKING IN : "L")
8	PACKOUTSW	I	Detection input from the PACK OUT switch. (PACK OUT : "L")
9,10,14,17-19, 31,34,35,44,45, 49-51,54-56, 61-64	–		These pins are connected to the ground.
11	Avss	–	Ground pin.
12	XINT	I	Interruption status input from the mechanism block.
13	P.DOWN	I	Power down detect input (normal : "H").
15	SQSY	I	Sub-code sync input.
16	DQSY	I	U-bit of digital in, CD format SUBQ SYNC input.
20	SYS.RST	I	System reset signal input.
21	TEST	I	This pin is normally connected to the ground.
22,66,100	+3.3V	–	+3.3 V power supply pin.
23	BACK-UP	I	Power supply pin for back-up.
24	X-OUT	O	32.768 kHz crystal connecting pin.
25	X-IN	I	
26,29,47,65,99	GND	–	Ground pin.
27	X-OUT	O	12.000 MHz crystal connecting pin.
28	X-IN	I	
32	SENS	I	Internal status input from the mechanism block.
33	SHOCK	I	Shock detection input from the mechanism block.
36	STB	O	Strobe signal output to the power supply circuit. (Regulator IC on/off control.)
37	REC-P	I	Detection input from the REC position switch (REC : "L").
38	PB-P	I	Detection input from the PB position switch (PB : "L").
39	LDLOW	O	Loading speed control output.
41	MNT2	I	Internal status input from the mechanism block.
42	MNT3	I	Internal status input from the mechanism block.
43	LED0	O	Power on : "H", standby : "L".
48	+3.3V	–	Power supply input (+3.3 V).
52	SDA	I/O	Data signal in/out from/to the mechanism block.
53	SCL	O	Clock signal output to the mechanism block.
57	MRXD	I	RS232C terminal.
58	MTXD	O	
59	MRST	O	
60	MCST	I	
67	SCLK	I/O	Clock signal output to the serial bus in the mechanism block.
68	SWDT	I/O	Write data signal output to the serial bus in the mechanism block.
69	SRDT	I	Read data signal input from the serial bus in the mechanism block.
70	EMPO	O	Playback emphasis on/off control ("H" : emphasis on).
75	LDON	O	Laser on/off control output ("H" : on).
77	FOK	I	Focus O.K signal input from the mechanism block.
80	WRPWR	O	Laser power select output to the mechanism block (includes optical block).
81	DIG-RST	O	Reset signal output for digital section.
83	DA-RST	O	Reset signal output to the D/A converter.
86	MOD	O	Laser modulation select signal output.
89	SCTX	O	Write data transmission timing output to the mechanism block.
90	XLATCH	O	Latch signal output to the serial bus.
93	AMUTE	O	Line out muting signal output. ("L" : mute)
94	LDOUT	O	Loading motor control output.
95	LDIN	O	
96	LIMITIN	I	Detection input from the limit in switch. (Limit in : "L")
97	PROTECT	I	Detection input from the protect switch. (Protect : "L")
98	REFLECT	I	Detection input from the reflect switch. (Low reflection : "L")

TC9413AP (Electric volume control)



UPD78053GC (System control MI-COM)

PIN No.	PORT NAME	I/O	FUNCTION
1-3	KEY1-3	I	Operation switch input (A/D input).
4,33,71,73	D.GND	–	Ground pin for digital section.
5	MCST	O	RS232 terminal to the MD mechanism control IC.
6	MRST	I	RS232 terminal from the MD mechanism control IC.
7,68,74,75	+3.3V	–	Power supply pin.
8	MTXD	I	RS232 terminal from the MD mechanism control IC.
9	MRXD	O	RS232 terminal to the MD mechanism control IC.
10	CHACK-IN	I	Detection input from the chacking in switch.
11	FLRST	O	Reset signal output to the FLD driver IC.
12	FLDATA	O	Serial data output to the FLD driver IC.
13	FLCP	O	Clock pulse output to the FLD driver IC.
14	FLCS	O	FLD driver IC chip select control output.
15	SCHACK-IN	O	Chacking in switch buffered detection output to the MD mechanism control MI-COM.
16	BUS-D-I	I	Serial data input from the CD MI-COM.
17	BUS-D-O	O	Serial data output to the CD MI-COM.
18	BUS-CLK-IN	I	Serial clock input from the CD MI-COM.
19-35,40, 42-49,54,55, 61-66,76-78	–	–	Not used (connected to the ground).
36	BUS-REQ	O	Data transfer request signal output to the CD MI-COM.
37	VCK	O	Serial clock output to the EVR.
38	VSTB	O	Strobe signal output to the EVR.
39	VDATA	O	Serial data output to the EVR.
41	PAC-OUT	I	PACK detection input from the mechanism block.
50	S-AMUTE	O	Line out muting control output.
51	VF-ON/OFF	O	FLD filament on/off control output.
52	STB	I	Power supply strobe signal input from the mechanism control MI-COM.
53	MICRO-LED	O	Pilot LED on/off control output.
56	P.LED	O	Standby/on LED on/off control.
57	DARST	–	Not used.
58	OPTION/MICRO	–	MD-500 : “H”, MD-720 : “L”
59	J-VERSION	–	Version of the model is determined by this pin.
60	RST	I	Reset input of this IC.
67	REMOCON	I	Remote control signal input.
69	X2	O	Crystal connecting pin.
70	X1	I	
79	ENC-2	I	Input from the rotary encoder switch.
80	ENC-1	I	

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